Short Communication

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ICD10 Code Modification Corresponding to DPC System in Japan

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Abstract

In order to realize the informatizaton of health system, it is indispensible to standardize the data format. That is, a set of standard code of diagnoses and procedures is necessary. In Japan, there are little problems for coding of procedures, because the coding system of procedures has been already introduced into the claim processing computer system. On the contrary, the coding of diagnosis has problems for its correctness. The two mains reasons are immature ability of clinical coders and intrinsic ambiguity of ICD structure. In order to solve these problems, we have investigated the coding quality based on the Japanese casemix data, so called DPC data. Using the research results, we have categorized the pattern of mistakes and developed a set of additional code for accurate ICD indexing.

Key words: DPC, ICD10, health information, coding, e-claim

❖Introduction

In order to re-organize the health system, the Japanese government is trying to advance the informatization of health system[1)]. One of the main targets of IT project in the health sector is to generalize the e-claim system. In order to realize this scheme, it is indispensible to standardize the data format. That is, a set of standard code of diagnoses and procedures is necessary. For the procedure code, the Japanese procedure code is available. The Ministry of Health, Labour and Welfare (MHLW) prepares the master tables of standard code for procedures, drugs and materials[2)]. So if all of the medical institutions introduce these master tables into their claim processing computer system, there would be little problems for digitize the procedure information.

On the contrary, it is rather difficult to allocate appropriate codes for diagnoses. There is no official regulation about how to decide the name of diagnosis for each patient. A physician is permitted to allocate the name of diagnosis by his own preference. Thus

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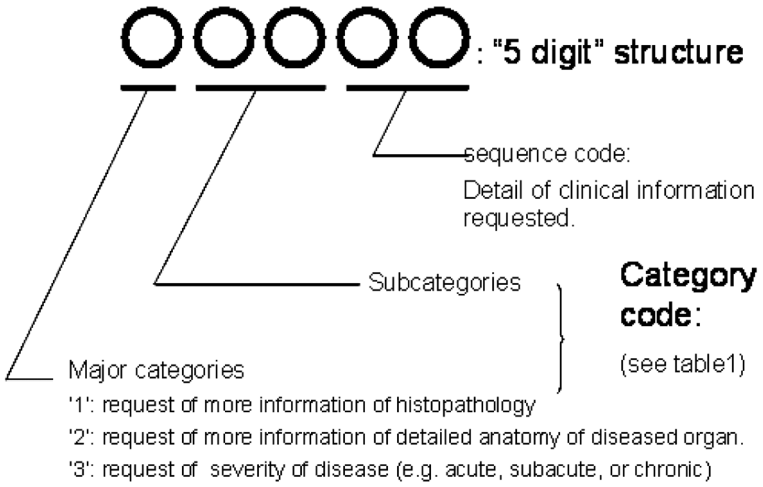

Figure 1. Structure of additional information code

there are tremendous numbers of diagnoses in the master table of diagnoses prepared by MEDIS-DC[2].

Since 2002, MHLW has implemented the casemix based evaluation scheme for the acute care hospitals, the DPC (Diagnosis Procedure Combination) project[3]. This program was started from 82 special functional hospitals (University hospital and National center) in 2002, and has expanded to about 1,550 acute care hospitals in 2010. This corresponds to 500,000 acute care beds of Japan. They have been requested to submit the clinical and claim data to the Ministry of Health, Labor and Welfare.

In the DPC algorithm, diagnosis, procedure, and co-morbidity/complication are three key variables for the classification. Additional information (e.g. birth weight in the case of neonatal intensive care) is also referred to in some groups. Diagnosis and co-morbidity/complication were coded following ICD10 (International Classification of Diseases 10th revision) coding scheme, and procedures are coded in the Japanese Procedure Code as defined in the fee schedule of the national health insurance system.

However, there were several problems in order to apply the ICD10 coding to claim. As ICD10 was originally developed for coding of cause of death, it is not always appropriate for clinical coding. In order to solve this problem, we have to prepare a complementary table for adequate disease coding using ICD10 indexing. As the DPC project is an important trial stone for the generalization of e-claim, it is rather important to sophisticate the coding system of DPC. For this purpose we have investigate the actual situation of DPC coding among the 82 special function hospitals and formulated a proposal for additional indexing for more appropriate ICD coding.

❖Material and Methods

We have used the submitted data from 82 special functional hospitals (University hospital and National center) in 2004 and 2005. We have reviewed the data of 754,904 cases in order to identify the inconsistency between principal diagnosis and corresponding ICD10 indexing. According to the review results by specialist panel (a group of clinical coders), we have detected some problems connoted in ICD10 classification and classify problems into several groups. And then we have formulated a proposal how to modify ICD10 code to make ease the determination of DPC code number.

❖Result

We have detected the following problems about current coding situation among the DPC based hospitals;

1. Incorrect ICD indexing because of unskilled coding
2. Incorrect ICD indexing because of Japanese medical jargon by physicians
3. The classification of organ or pathology is not refined because the precise description of principal disease is not possible in ICD10.
4. Some ICD10 codes have insufficient implication of organ or others of pathology.

Table 1 Additional information code

category code	category name	sequence code	Additional information	Additional information code
101	category1, pathology1	00	small-cell-carcinoma	10100
		01	non- small-cell-carcinoma	10101
		09	unknown or unspecified	10109
201	category2, detailed anatomy of diseased organ1	00	scalp, face or posterior zone of	20100
		01	anterior neck or thoracic outlet zone	20101
		02	posterior chest wall	20102
		03	abdominal wall	20103
		04	coccyx or sacrum	20104
		05	pubis or pelvic ring	20105
		06	lower limb	20106
		07	upper limb including subclavicle	20107
		08	anterior chest wall or axillary zone	20108
		09	visceral organ	20109
202	category2, detailed anatomy of diseased organ2	00	oesophagus	20200
		01	duodenum	20201
		02	intestinal tract	20202
		03	anus and anal canal anus	20203
		04	liver	20204
		05	gallbladder, biliary tract	20205
		06	pancreas	20206
		07	spleen	20207
301	category3, severity of disease	00	chronic	30100
		01	acute	30101
		09	unknown or unspecified	30109

As the two first problems are to be solved by appropriate training of clinical coders, it would not be difficult to ameliorate the situation. However, the last two problems are intrinsic, that is, due to shortcomings of ICD10 logic, so complementary information must be collected in order to solve the problems.

For this purpose, we have developed some additional new codes to attached to conventional ICD10 codes, in order to compensate insufficient information (ex. more detailed anatomy or pathology). Figure1 shows the additional information code scheme that we have developed. We have attached 5 digits as additional information codes onto original ICD10 code. Of these 5 digits from the left, first three digits indicate pathology, organ or severity of disease, respectively.

In case that some ICD10 code does not indicate pathology in detail, '101' announced in the first three digits requests to demonstrate clinical information of histopathology in the remaining right two digits. Table 1 shows the detail of additional information code.

For example, in case of the malignant respiratory neoplasm (Table 2), the main-bronchus (C34.$), one of the following codes is given; 10100: small cell carcinoma, 10101: non small cell carcinoma, 10109: Unknown or unspecified. The '1' of the left three digits 101 request to announce the type of histopathology and '01' in the remaining two digits, 00 means small cell carcinoma, 01 non small cell carcinoma, 09 histopathology unspecified

Also, in case of the Skin of trunk (C34.$), one of the following codes is given; 20102(posterior chest wall) – 20109(visceral organ). The '2' of the left three digits 201 request of more information of detailed anatomy of diseased organ, and '00' in the remaining two digits, 00 means scalp, face or posterior zone of neck, 01 anterior neck or thoracic outlet zone, ---,09 visceral organ (Table 3).

In the case of heart failure, there is no classification between acute and chronic in the ICD coding. This situation is very inconvenient for clinical application. Thus we have developed the additional coding for heart failure as in Table 4.

❖Discussion

Considering the economic limitation of available resources for health sector, it is very important to equip the good quality health information system in order to realize an appropriate resource allocation. This requires the standardization of data format. Especially information about diagnosis and proce-

Table 2 Additional information code (Histopathology)

ICD	ICD category:	cat. code	cat.name	seq. code	Additional information	Additional information code
C340	Main bronchus	101	category1, pathology1	00	small-cell-carcinoma	10100
				01	non- small-cell-carcinoma	10101
				09	Unknown or unspecified	10109
C341	Upper lobe, bronchus or lung	101	category1, pathology1	00	small-cell-carcinoma	10100
				01	non- small-cell-carcinoma	10101
				09	Unknown or unspecified	10109
C342	Middle lobe, bronchus or lung	101	category1, pathology1	00	small-cell-carcinoma	10100
				01	non- small-cell-carcinoma	10101
				09	Unknown or unspecified	10109
C343	Lower lobe, bronchus or lung	101	category1, pathology1	00	small-cell-carcinoma	10100
				01	non- small-cell-carcinoma	10101
				09	Unknown or unspecified	10109
C348	Overlapping lesion of bronchus and lung	101	category1, pathology1	00	small-cell-carcinoma	10100
				01	non- small-cell-carcinoma	10101
				09	Unknown or unspecified	10109
C349	Bronchus or lung, unspecified	101	category1, pathology1	00	small-cell-carcinoma	10100
				01	non- small-cell-carcinoma	10101
				09	Unknown or unspecified	10109

Table 3 Additional information code (Detailed anatomy of diseased organ)

ICD	ICD category:	cat. code	cat.name	seq. code	Additional information	Additional information code
C445	Skin of trunk	201	category2, detailed anatomy of diseased organ	02	posterior chest wall	20102
				03	abdominal wall	20103
				04	coccyx or sacrum	20104
				05	pubis or pelvic ring	20105
				08	anterior chest wall or axillary zone	20108
				09	visceral organ	20109
C493	Connective and soft tissue of thorax	201	category2, detailed anatomy of diseased organ	02	posterior chest wall	20102
				08	anterior chest wall or axillary zone	20108
C859	Non-Hodgkin's lymphoma, unspecified type	201	category2, detailed anatomy of diseased organ	00	scalp, face or posterior zone of neck	20100
				01	anterior neck or thoracic outlet zone	20101
				02	posterior chest wall	20102
				03	abdominal wall	20103
				04	coccyx or sacrum	20104
				05	pubis or pelvic ring	20105
				06	lower limb	20106
				07	upper limb including subclavicle area	20107
				08	anterior chest wall or axillary zone	20108
				09	visceral organ	20109

dures is indispensible for the reliable decision making. Although the Japanese Procedure Code has ambiguity for definition of some procedures, there is little possibility of wrong choice of code. On the contrary, the data quality of diagnosis has some problems, as shown in this study. In the case of DPC classification, this

Table 4 Additional information code (severity of diseseas)

ICD	ICD category:	cat. code	cat.name	seq. code	Additional information	Additional information code
I50	Heart failure	301	category8, severity of disease	00	chronic	30100
				01	acute	30101
				09	unknown or unspecified	30109

ambiguity does not cause big problems because the "diagnosis =the first 6 digits" contains a set of similar diagnoses. The DPC system is constructed in order to be robust for such ambiguity of ICD indexing.

However, if we want to apply the ICD10 for the e-claim system that cover entire range of medical activities including out-patient services, we need more precise and robust coding system.

As the result of our study has indicated, there are two major causes for inappropriate ICD indexing; inadequate ability of clinical coders and intrinsic problem of ICD structures. For the first problem, there must be a good education system. In order to respond this requirement, we have established a one-year corresponding training course, so called the DPC coding course, since 2009 as one of the continuous training courses of Japan Hospital Association. It is expected that this course will ameliorate the ability of clinical coders and then the quality of DPC coding data.

For the problem rooted from the ambiguity of ICD definition itself, we have developed a set of additional codes as shown in Tables 1–4. The new coding system has been adopted to the governmental DPC research program since 2005. Using this dataset, it has become to analyze the clinical procedure in more precise way. For example, Kuwabara *et al.* revealed the difference in use of pharmaceuticals between small cell lung cancer and non-small cell cancer[4]. His study suggested that the exactness of ICD indexing would influence on the validity of classification and economic evaluation of casemix grouping.

The Japanese government intends to advance the IT application in the health sector. The standardization of data format is the most important base for the project. The experiences of DPC projects during the past 9 yr will be very suggestive for the implementation of IT strategy of government.

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